

## SOURCE CODE:

```
#include <iostream>
using namespace std;
int main()
{
    int data[10];
    int dataatrec[10], c, c1, c2, c3, i;
    cout << "Enter 4 bits of data one by one\n";
    cin >> data[0];
    cin >> data[1];
    cin >> data[2];
    cin >> data[4];
    // Calculation of even parity
    data[6] = data[0] ^ data[2] ^ data[4];
    data[5] = data[0] ^ data[1] ^ data[4];
    data[3] = data[0] ^ data[1] ^ data[2];
    cout << "\nEncoded data is\n";

    for (i = 0; i < 7; i++)
        cout << data[i];
    cout << "\n\nEnter received data bits one by one\n";
    for (i = 0; i < 7; i++)
        cin >> dataatrec[i];
    c1 = dataatrec[6] ^ dataatrec[4] ^ dataatrec[2] ^ dataatrec[0];
    c2 = dataatrec[5] ^ dataatrec[4] ^ dataatrec[1] ^ dataatrec[0];
    c3 = dataatrec[3] ^ dataatrec[2] ^ dataatrec[1] ^ dataatrec[0];
    c = c3 * 4 + c2 * 2 + c1;

    if (c == 0)
    {
        cout << "\nNo error while transmission of data\n";
    }
    else
    {
        cout << "\nError on position " << c;
        cout << "\nData sent : ";
        for (i = 0; i < 7; i++)
            cout << data[i];
        cout << "\nData received : ";
        for (i = 0; i < 7; i++)
            cout << dataatrec[i];
        cout << "\nCorrect message is\n";
    }
}
```

```
// if erroneous bit is 0 we complement it else vice versa
    if (dataatrec[7 - c] == 0)
        dataatrec[7 - c] = 1;
    else
        dataatrec[7 - c] = 0;
    for (i = 0; i < 7; i++)
    {
        cout << dataatrec[i];
    }
}
return 0;
}
```

## OUTPUT:

No Error

```
kryo@rafale: ~/Desktop/MBA Tech/CN/Experiment4
kryo@rafale:~/Desktop/MBA Tech/CN/Experiment4$ g++ hamming.cpp
kryo@rafale:~/Desktop/MBA Tech/CN/Experiment4$ ./a.out
Enter 4 bits of data one by one
1
0
1
0

Encoded data is
1010010

Enter received data bits one by one
1
0
1
0
0
0
1
0

No error while transmission of data
kryo@rafale:~/Desktop/MBA Tech/CN/Experiment4$
```

With Error

```
kryo@rafale: ~/Desktop/MBA Tech/CN/Experiment4
kryo@rafale:~/Desktop/MBA Tech/CN/Experiment4$ ./a.out
Enter 4 bits of data one by one
1
0
1
0

Encoded data is
1010010

Enter received data bits one by one
1
0
0
0
0
0
1
0

Error on position 5
Data sent : 1010010
Data received : 1000010
Correct message is
1010010kryo@rafale:~/Desktop/MBA Tech/CN/Experiment4$
```

